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ABSTRACT

One way to assure that assessment can have a positive impact on learning is to begin by understanding the nature of formative assessment. Understanding the distinction between formative and summative assessment will make it possible to use each for improvement of education. It becomes increasingly important that schools promote learning that is actively understood and internalized by the learner. The mere rote learning of facts will not suffice in the current and future worlds of rapid technological change. Knowing about students' existing ideas and skills and recognizing the point reached in development and the necessary next steps to take constitutes formative assessment of students. Formative assessment is essentially feedback to the teacher and the student about present understanding and skill development in order to determine the way forward. Summative assessment describes learning achieved at a certain time for reporting to parents, other educators, students themselves, and other interested parties. Using and articulating the distinction between these types of assessment is discussed in the context of the United Kingdom's National Curriculum. Both types of assessment must be integral to teacher education in order to ensure educational improvement. (Contains 19 references.) (SLD)

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Creating a Positive Impact of Assessment on Learning

Paper presented as part of the symposium on *Investigating Relationships between Student Learning and Assessment in the Primary School* at the AERA annual conference, New York, April, 1996.

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The impact of assessment on learning has been very thoroughly researched and reviewed (see Crooks (1988) for a comprehensive overview). There are three points to draw out from the existing work of relevance to this paper whose aim is to find a way forward to ensure that assessment can have a positive impact on learning. First, that it is the *style* and *methods* of assessment that are often seen as the seat of the negative impact (eg Elton and Laurillard, 1979). In the US particular attention has been given to impact of standardised tests (e.g. Madaus, 1988). Second, there is an assumption that the *results* of assessment carried out for one purposes can equally well serve other purposes. The third point, implied in this, is that the *nature* of formative assessment - the kind which should have a positive impact on learning - is not understood as being distinctively different from summative assessment.

The aim of this paper is to deal with these general points, by starting from the third one and working towards a conception of formative assessment which distinguishes it from summative assessment. Once the essential differences are laid bare, then a way forward to linking assessment for these two purposes - without causing the damaging washback on learning - can be suggested. This involves helping teachers use *information* about students which they have gathered in the course of their teaching in ways which preserve the distinction between formative and summative assessment and enables each to serve its different purposes.

Learning with understanding

We begin from the assumption that an important aim of education is to bring about learning with understanding. This has been called learning as an *interpretative* process (Saljo, 1979; Broudy, 1988) or deep learning (Entwistle and Ramsden, 1983; Marton et al, 1984; Entwistle and Entwistle, 1992). It is not the only kind of learning. There are some things that are probably most efficiently learned by rote, such as number bonds, spellings, multiplication tables; there are skills that are most useful to us when they have been practised sufficiently to become automatic. There are also bodies of knowledge (facts and information) that it is reasonable for society to expect teachers to teach and for students to learn, although there are still debates about *what* knowledge and *whose* knowledge is most important. However the exponential increase in the amount of factual information in recent years and for the foreseeable future, coupled with the rapid changes in the nature of employment, indicate that there should be far greater emphasis on learning which can be transformed and applied to new circumstances than on learning facts and procedures applicable only in situations closely similar to those in which they were learned. Indeed it

is the need of the whole population to be able to translate and interpret what they learn that makes the case for universal schooling (Broudy, 1988). From his review of relevant research, Crooks concludes that 'there seems to be a strong case for encouraging the development of deep strategies from the early years of the educational system'. (Crooks, 1988, p 447)

Crooks refers here to the simple but powerful way of identifying the approaches to learning which lead, on the one hand to understanding and on the other to rote memorisation, in terms of the distinction between *deep* learning and *surface* learning, defined as follows (see, for example, Ausubel et al, 1978; Marton et al, 1984; Entwistle and Entwistle, 1992):

Deep learning approach	Surface learning approach
An intention to develop personal understanding	An intention to be able to reproduce content as required
Active interaction with the content, particularly in relating new ideas to previous knowledge and experience	Passive acceptance of ideas and information
Linking ideas together using integrating principles	Lack of recognition of guiding principles or patterns
Relating evidence to conclusions	Focusing learning on assessment requirements

Between surface learning and deep learning Marton et al (1984) also proposed an intervening category which they called 'strategic learning'. This reminds us that efficient learning is often a combination of both surface and deep learning, for if we were to learn everything in depth we would have time to learn very little. Likewise, if everything was surface learning we could hardly describe ourselves as educated at all. Assessment has a role in all kinds of learning. In memorising facts and learning physical skills it is used to find out what facts or skills have been acquired and the feedback it provides to help further learning is in terms of what has not been learned. Assessment has quite a different role in learning with understanding and it is this that is the concern in this paper and which is now considered.

First we look in more detail at the characteristics of the learning it is intended to bring about. By definition it is learning which is actively understood and internalised by the learner. It makes sense in terms of a learner's experience of the world and is not simply a collection of isolated facts which have been memorised. As noted above, it differs from rote learning essentially in that it is linked to previous experience and so can be used in situations different from that in which it was learned. What is known and understood will, of course, change with new experience and as new ideas and skills are presented to help make sense of it. Thus the characteristics of this learning are that it:

- is progressively developed in terms of big ideas, skills for living and learning, attitudes and values;
- is constructed on the basis of previous ideas and skills;
- can be applied in contexts other than those in which it was learned;
- is owned by the learner in the sense that it becomes a fundamental part of the way he or she understands the world; it is not simply ephemeral knowledge that may be memorised for recall in examinations but subsequently forgotten.

It follows that to promote this kind of learning, what is needed are learning experiences that:

- are well matched to the existing point of development of the ideas, skills, attitudes and values;
- have continuity with, and build on, previous experience;
- relate to current interests and experience;
- are perceived by learners as relevant, important, stimulating and valued for themselves, rather than simply for their usefulness in passing tests and examinations.

The provision of learning experiences with these kinds of characteristics depends on the teacher:

- having a thorough and deep understanding themselves of the subject matter to be taught, how students are likely to learn it and the difficulties and misunderstandings they are likely to encounter;
- having a clear idea of the progression in the ideas, skills etc. which are the goals of learning and the course students are likely to take in this development;
- being able to recognise the point in this development reached by their students;
- knowing and being able to use various strategies to find out and to develop students' ideas skills, etc.

The first item in this list has important implications for teacher education but it is also relevant in the present context of considering kinds of learning. Teachers cannot provide experiences and activities that guide students' progress towards understanding of ideas if they themselves do not know what these ideas are; nor can they provide experiences that challenge students' misunderstandings if they themselves share the same misunderstandings. Although teachers generally have sound pedagogic skills to carry them through 'difficult' aspects of the subjects they teach, the result for students are restricted and impoverished learning opportunities, particularly for learning aimed at understanding. For example, recent research into teaching science at the primary level indicated that the coping strategies adopted by teachers with poor background knowledge included relying heavily on prescriptive workcards or texts giving students step-by-step instructions, emphasising process aims and neglecting conceptual development, minimising students' opportunities to ask questions, avoiding practical work and any equipment likely to go wrong (Harlen, Holroyd and Byrne, 1995).

The role of assessment

Knowing about students' existing ideas and skills, and recognising the point reached in development and the necessary next steps to take, constitutes what we understand to be *formative assessment*. Formative assessment is essentially feedback to the teacher and to the student about present understanding and skill development in order to determine the way forward. Assessment for this purpose is part of teaching; learning with understanding depends on it. To use information about present achievements in this way means that the progression

in ideas and skills must be in the teacher's mind - and as far as possible in the students' - so that the next appropriate steps can be considered.

Summative assessment has a quite different purpose, which is to describe learning achieved at a certain time for the purposes of reporting to parents, other teachers, the students themselves and, in summary form, to other interested parties such as school governors or school boards. It has an important role in the overall educational progress of students but not in day-to-day teaching as does formative assessment. As the next section of this paper attempts to show, it is the distinction between, and the articulation of, assessment for these two purposes that is central to using assessment to improve educational standards.

The nature of assessment as part of teaching

This kind of assessment has to be carried out by the teacher, but it is important to avoid the assumption that all assessment by teachers is formative, i.e. to equate teacher assessment with formative assessment. Unlike summative assessments, which may be either criterion-referenced or norm-referenced, formative assessments are always made in relation to where students are in their learning in terms of specific content or skills. To this extent, formative assessment is, by definition, *criterion-referenced*. At the same time, it may also be *student-referenced (or ipsative)* because, if this assessment is to help learning and to encourage the learner, it should take into account the effort and the particular circumstances of the student, and the progress that the student has made over time (their individual achievements). If formative assessment were purely criterion-referenced it would be profoundly discouraging for many students who are constantly being faced with failure. This hybrid of criterion-referenced and ipsative assessment does not matter as long as this information is used *diagnostically* in relation to each student, which is consistent with the notion that formative assessment is essentially part of teaching.

The claim that criterion-referenced systems often only thinly disguise norm-referenced systems would lead to the contentious notion that there is some degree of norm-referencing in formative assessment. It is true that any attempt to articulate a trajectory of development of knowledge, skill and understanding in any subject domain often implies assumptions about 'normal' stages of development and progression. Also, judgements about an individual's progress in relationship to others is sometimes helpful in identifying whether there is an obvious problem that needs to be tackled urgently. This is probably a main reason why parents continue to be so concerned about where their child is in relation to the attainments of others of the same age. The point to be made here in the context of formatve assessment, however, is that whilst norm-referenced assessment might help teachers recognise the existence of a problem, it can offer them no help in knowing what to do about it and may simply have a deleterious effect by labelling or pigeon-holing students. In order to contribute to learning through teaching, assessments need to reveal the specific nature of any problems; this can only be achieved by a combination of criterion- and student-referenced assessments.

Essentially this kind of formative assessment, which involves using information about their learning gathered from observing students, listening to them discussing informally with their peers as well as when talking to the

teacher, reviewing written work and other products, and using their self-assessments, has always been part of teachers' work. However, it has often been carried out less systematically than is required to serve its purpose effectively and not always used in helping to identify the next steps in learning. Concern for deeper learning and what is known as the 'constructivist' view of learning, which recognises the extent to which learners 'construct' maps or models in their minds which help them make sense of the relationship between their previous experience and new knowledge, has done much to draw attention to aspects of students' thinking that teachers should take into account. Gaining access to the ideas that students have already formed, accurate or otherwise, is an integral part of teaching for understanding and requires teachers to adopt new strategies for lesson planning and different forms of questioning (Harlen, 1996).

It is important to recognise that the reality of formative assessment is that it is bound to be incomplete, since even the best plans for observing activities or setting certain tasks can be torpedoed by unanticipated events. Moreover, the information will often seem contradictory. Students are always changing and may appear to be able to do something in one situation but not in another. Such evidence is a problem where the purpose is to make a judgement about whether a student fits one category, criterion, or one level or another. However where the purpose is to inform teaching and help learning, the fact that a student can do something in one context but apparently not in another is a positive advantage, since it gives clues to the conditions which seem to favour better performance and thus can be a basis for taking action.

It is not necessary to be over-concerned with *reliability* in formative assessment since the information is used to inform teaching in the situations in which it is gathered. Thus there is always quick feedback for the teacher and any misjudged intervention can be corrected. Through this rapid loop of feedback and adjustment between teacher and learner the information inevitably acquires greater reliability. This is not to say that teachers do not need any help with this important part of their work, but the help required is to be found in how to identify significant aspects of students' work and to recognise what they mean for promoting progress.

In the feedback between teacher and students both parties need to be involved in decisions about the next steps in learning. The learner who recognises for him or herself how to move forward is likely to take responsiblity for making the necessary effort. Involving students in their own assessment means that they must know what are the aims of their learning. Communicating these aims is not easy but the rewards of successfully attempting it are quite considerable, not only for help in assessment, but the obvious potential for self-direction in learning. Direct communication of complex learning objectives and criteria of achievement is unlikely to be successful but students can develop understanding of them through experiences designed to involve them in looking critically at their own work. In the primary school these might involve asking students to select their best pieces of work and then discussing why the particular ones were chosen. More generally the comments made by the teacher on pieces of work convey what is expected and valued. Teachers of older students can more explicitly share with

the students the criteria they use both in assessing practical skills and marking written work.

In summary, we have attempted to clarify the distinction between formative and summative assessment by suggesting that the characteristics of formative assessment are that:

- it is essentially positive in intent, in that it is directed towards promoting learning; it is therefore part of teaching
- it takes into account the progress of each individual, the effort put in and other aspects of learning which may be unspecified in the curriculum; in other words, it is not purely criterion-referenced
- it has to take into account several instances in which certain skills and ideas are used and there will be inconsistencies as well as patterns in behaviour; such inconsistencies would be 'error' in summative evaluation, but in formative evaluation they provide diagnostic information
- validity and usefulness are paramount in formative assessment and should take precedent over concerns for reliability
- even more than assessment for other purposes, formative assessment requires that students have a central part in it; students have to be active in their own learning (teachers cannot learn for them) and unless they come to understand their strengths and weaknesses, and how they might deal with them, they will not make progress.

The characteristics of summative assessment are that

- it takes place at certain intervals when achievement has to be reported
- it relates to progression in learning against public criteria
- the results for different students may combined for various purposes because they are based on the same criteria
- it requires methods which are as reliable as possible without endangering validity
- it involves some quality assurance procedures
- it should be based on evidence from the full range of performance relevant to the criteria being used.

Obstacles to formative assessment

In the UK the descriptions of attainment in the National Curriculum have provided criteria (at levels 1 - 10, recently revised to 1-8, in the National Curriculum and levels A - E in the Scottish Guidelines) for teachers to use in their assessment and have thus added rigour that was formerly missing. However, emphasis in the guidance to teachers has been on the application of the criteria to students' achievements, for the purpose of deciding what level they have reached, to the neglect of the genuinely formative use of assessment. Thus, as research evidence shows (for example, James, 1994), teachers have struggled to operate strictly criterion-referenced assessment and have been so concerned to identify levels that they have rarely used the information, in any explicit way, to help students progress.

Present practice in assessment in England cannot all be linked back to the Task Group on Assessment and Testing (TGAT) report of 1988; the changes in the course of its implementation have been well documented by Daugherty

(1995). Nevertheless it was the TGAT report that put the terms *formative, diagnostic, summative* and *evaluative* into common circulation and defined them. The distinction between formative and summative was made mainly in terms of purpose and timing:

> '- formative, so that the positive achievements of a student may be recognised and discussed and the appropriate next steps may be planned
> - summative, for the recording of the overall achievement of a student in a systematic way.'
> (TGAT, 1988, para 23)

The assumption that these were not different *in kind* is clear in the claim that some purposes could be served by combining assessment originally made for different purposes. 'It is possible to build up a comprehensive picture of the overall achievements of a student by aggregating, in a structured way, the separate results of a set of assessments designed to serve formative purposes.' (TGAT, 1988, para 25)

The message that formative and summative are easily related in this way and are of the same kind was reinforced by concern for standardisation, 'in order to ensure comparability' (TGAT, 1988, para 44). This concern is rightly raised in relation to summative assessments which may be used to make comparisons between students or to provide results which can be aggregated to give whole class or whole school profiles. However, set beside the above view that summative assessments can be formed by simple aggregation of formative ones, it leads to the inevitable conclusion that formative assessments must also be 'standardised'.

The authors of this paper believe that the assumption of this relationship between summative and formative is simplistic and, moreover, that it has had a detrimental effect on the assessment that teachers carry out. It has led teachers to change their own on-going assessment into a series of 'mini' assessments each of which is essentially summative in character.

In a recent study, James (1994) provided evidence of this by reporting that whilst she had observed teachers were becoming more sophisticated in terms of understanding the NC criteria and judging attainment accurately and consistently, there was little evidence that they were using these judgements formatively except, perhaps, in unarticulated ways or to monitor curriculum coverage. These findings indicated that despite the 'lip service' that has been paid to the importance of teacher assessment for teaching and learning, the requirement to produce a summative 'level' for statutory purposes has dominated. In other words, a fundamental conflict between formative and summative purposes in teacher assessment remains.

A different approach to linking formative and summative assessment

It is not being suggested that information gathered by teachers for formative purposes should not be used when they come to make summative assessments. This would be wasteful and, in any case impossible in practice, for teachers cannot ignore knowledge that they have of students. Instead we regard it as

essential to distinguish different ways of *arriving at an assessment* for different purposes.

At this point it is useful to recall that the kind of information that is gathered by teachers in the course of teaching is not tidy, complete and self-consistent, but fragmentary and often contradictory. The unevenness, as mentioned earlier, is not a problem but an advantage for formative purposes, helping to indicate what supports or hinders achievement for a particular student. However, these uneven peaks and troughs have to be smoothed out in reporting performance for summative purposes. Thus although some of the same *evidence* can be used for formative and summative purposes, for the latter it has to be reviewed and aligned with criteria applied uniformly across all students. This means looking across the range of work of a student and judging the extent to which the profile as a whole matches the criteria in a holistic way.

The alternative to using the same *results* of assessment for both purposes is to use relevant *evidence* gathered as part of teaching for formative purposes but to review it, for summative purposes, in relation to the criteria which will be used for all students. This means that formative assessment can remain a mixture of criterion-referenced and student-referenced assessment, as is required for providing a positive response to students and encouraging their learning. At the same time the use of information gathered as part of teaching, appropriate for formative assessment but which could be misleading or even confusing if used directly for summative assessment, is filtered out in the process of reviewing information relevant to the criteria being applied, in the level descriptions, for example.

What this approach can mean in practice is illustrated by an example taken from a package of material devised to support primary teachers in Scotland in using diagnostic assessment to help students learn science. The material describes in detail the work of a group of 10 to 11 year olds investigating camouflage as part of an environmental studies project. They planned the details of the investigation themselves following broad suggestions from the teacher. It involved placing cut out figures painted in different colours against different backgrounds and judging which was easiest to see from a distance. There were many opportunities, some taken and some missed, to plan and conduct a controlled investigation. Although the students worked in groups of six there was plenty of opportunity for the teacher to observe the performance of all the students in relation to different aspects of investigation - planning, finding out, recording, interpreting and reporting (SOED, 1993). The account given in the pack provides detailed evidence about two of the students in the form of descriptions of their actions and reproductions of their work. A commentary highlights significant aspects of the work from which are drawn suggestions for further progress. For example, in relation to their planning:

> Ben (who had shown a clear idea of how to carry out the investigation in the way selected) would be helped by being asked to thinking of different ways of approaching the investigation. What do you want to find out from your investigations? Can you put this in the form of a question you want to answer? In what different ways could you set about answering this questions?
>
> Anna (who had not shown a good grasp of what was being tested in the investigation) would benefit from being challenged to give reasons for her planned actions and to distinguish between things which are important to the investigation and those which are not. Was it important that this was done in this way? Why? If

someone else were going to do this what would be the most important things to tell them?

The same information is also used to help the teacher to judge the level of the work against the criteria set out in the attainment targets of the curriculum. In this matter, however, the account is accompanied by a warning. The work described was an extended investigation carried out at intervals over several days. It is noted that the 'level' of the students' work appeared to change during this time.

> Had an assessment been made of their work in planning the investigation at the end of the first hour or so, most would seem to have been operating at the level of "suggests possible strategies for carrying out an investigation including resources without much thought for a controlled investigation ...." However, as the work proceeded their continuing planning showed attention to some of the controls necessary for the comparison of colours to be fair. This cautions against making assessments at too early a point in an investigation when students are considering a number of possibilities in a fairly superficial manner rather than a few with more rigour, as they may do later.

Another example shows a missed opportunity to distinguish between the formative and summative use of the information leads to a neglect of the formative value of the information. One element of the 'Exemplification of Standards' material distributed to all schools in England and Wales in 1995 by SCAA/ACAC is a video and booklet containing evidence of students engaged in speaking and listening (English Attainment Target 1) and judged to be at various levels from 1 to 8. The Key Stage Three (lower secondary) material includes footage of a girl named Nicole, for whom English is 'an additional language', who is seen contributing to four different activities. A teacher viewing this video might notice that Nicole watches the faces of peers very closely, although sometimes obliquely, and sometimes angles herself so that she can read the text from which they are reading. She is often to the side of group interaction and has difficulty breaking into a fast verbal exchange. Occasionally her contributions are 'talked over' by others who are more forceful. However, when the activity gives her an opportunity to 'have the floor' she speaks quietly and slowly but more confidently and her contributions are structured and comprehensible. This kind of evidence might be used formatively by the teacher to indicate how Nicole's learning in this area might be extended by building on her listening skills, by acknowledging the tremendous progress she has made in competent use of her second language, by helping her with sentence constructions that she finds especially difficult, by providing her with more opportunities to speak in formal presentations where she cannot be interrupted by more confident peers, and by working with the whole group on their understanding of the nature and dynamics of group discussion to allow better pacing, turn taking, listening, inclusion etc. But none of this is mentioned in the material accompanying the video because it is 'designed to help teachers make consistent judgements about which level best describes a student's performance' . Thus the commentaries on Nicole's contributions relate strictly to the general criteria embedded in the level descriptions. The peaks and troughs and idiosyncrasies of her performance are ironed out for the purpose of coming to the following summary and overall judgement:

> Although she perhaps lacks confidence, Nicole contributes clearly and positively in discussions. She makes substantive points, gives reasons and is able to argue for her views when challenged. She is beginning to ask questions of others and take account of their views. She adjusts her speaking to more formal situations although she is not fully confident in standard English. Overall, Nicole's performance is best described by Level 5. (SCAA, 1995, p.30)

Many other examples similar to this last one indicate that the fundamental distinction between formative and summative assessment has not been fully articulated. Formative assessment involves, as we have said, a combination of criterion-referencing and student-referencing whereas summative assessment involves a combination of criterion-referencing and norm-referencing. Formative and summative assessment may relate to each other in that they share a set of common criteria which are agreed expectations in terms of desired outcomes, but beyond this they are essentially different phenomena with different assumptions and different methods. Some of the same evidence may be used for different purposes but it will be used in different ways.

Developing the new approach

It is essential to provide help for teachers with both formative and summative assessment and in a way which disentangles the two and enables teachers to use assessment in a genuinely formative way to help students' learning. For formative assessment, all four of the qualities required for fostering learning with understanding (page 3) need to be developed within initial teacher training and continuing professional development. In particular, teachers may need assistance in identifying 'next steps' in learning, perhaps in relation to some subjects, such as science, more than others. The further development of exemplar materials may be important here, but only if the materials are directed towards the need to make 'next steps' decisions, as in the Scottish material, rather than overall summative judgements. Teachers may also value examples of techniques for gaining access to students' ideas and for involving them in self-assessment.

For summative purposes a rather different view of the process of summarising needs to be taken than the ones used to date. Each piece of work, each observation made by the teacher, is used to build up a picture which is not determined by one or two events, since to demonstrate understanding of a concept or skill it has to be applied in different contexts. It is inappropriate to provide exemplars in terms of single pieces of work which are judged to meet the description at a certain level. Experience shows that this has a damaging washback effect on formative assessment. Rather, exemplar material in the form of portfolios of work from one student could be used to help teachers to develop the skills of applying the level descriptions in a holistic manner and to recognise that not every piece of work will fit the descriptions and neither will every element of the description at a level be represented in the portfolio. This may seem rather a loose procedure, but we have repeatedly pointed out (e.g. Harlen, 1994, p139; Harlen, 1996, p147) that assessment is not an exact matter, can never be, and if we try to treat it as such we may damage the very learning we are striving to bring about. It is less a technical matter of measurement and more a human act of judgement, albeit based on sound evidence. In our programmes for initial and in-service teacher training we need to provide

opportunities for them to develop confidence and expertise in making and using such judgements about, and for, learning. Then we might have confidence that standards of real learning will rise to meet the demands of the next century.

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